Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1. (currently amended) Curable powder coating having a glass transition temperature of at least 150°C in the cured state obtainable by

(i) mixing

(a) a polymeric binder[[,]] and at least one of an oxazine resin, a cyanate ester or a maleimide,

(b) a hardener or initiator,

(c) a coating additive,

(d) optionally a filler,

(e) optionally a compatibilizing polymer

and optionally further components

(ii) melt extruding the mixture obtained in step (i) and

(iii) milling and sieving the extruded mixture.

2. (currently amended) Powder coating according to claim 1, ~~characterized in that it~~ wherein the powder coating has a glass transition temperature in the uncured state of at least 20°C, ~~preferably at least 25°C and more preferably at least 30°C and that it~~ and has a glass transition temperature in the cured state of ~~at least 150°C, preferably~~ at least 160°C ~~and more preferably at least 170°C~~.

3. (currently amended) Powder coating according to claim 1, ~~characterized in that~~ wherein the polymeric binder is a solid epoxy resin.

4. (currently amended) Powder coating according to claim 1 ~~or 3, characterized in that~~ wherein the component (a) comprises a mixture of epoxy resins with a glass transition temperature of at least 20°C .

5. (currently amended) Powder coating according to claim 1, ~~3 or 4, characterized in that~~ wherein the epoxy resin is selected from the group consisting of standard solid epoxy resins based on bisphenol A and bisphenol A diglycidyl ether.

6. (currently amended) Powder coating according to claim 5, ~~characterized in that~~ wherein the epoxy equivalent weight of the epoxy resin is > 300 g/equivalent.

7. (currently amended) Powder coating according to claim 1, ~~characterized in that~~ wherein the epoxy resin contains a multifunctional epoxy resin or a mixture of multifunctional epoxy resins.

8. (currently amended) Powder coating according to claim 7, ~~characterized in that~~ wherein the multifunctional epoxy resin is selected from the group consisting of cresol-novolak epoxy resins, phenol-novolak epoxy resins and naphthol-containing multifunctional epoxy resins.

9. (currently amended) Powder coating according to claim 1, ~~characterized in that~~ wherein the cyanate ester is selected from the group consisting of bifunctional and multifunctional cyanate esters.

10. (currently amended) Powder coating according to claim 1, ~~characterized in that~~ wherein the maleimide is selected from the group consisting of bifunctional and multifunctional maleimides~~, preferably on the basis of aromatic diamines and in that~~ and the oxazine resin is selected from the group consisting of bifunctional and multifunctional oxazine resins.

11. (currently amended) Powder coating according to claim 1, ~~characterized in that~~ wherein the hardener is selected from the group consisting of phenolic hardeners, bisphenol A, dicyandiamide or modified dicyandiamide, acid anhydrides, aromatic and aliphatic amines ~~or~~ and ring-substituted diamines.

12. (currently amended) Powder coating according to claim 11, ~~characterized in that~~ wherein the hardener is dicyandiamide or a modified dicyanamide.

13. (currently amended) Powder coating according to claim 1~~, 11 or 12, characterized in that it contains~~ wherein the hardener or initiator is in an amount of 0.1 to 10 wt.-%~~, preferably 0.5 to 5 wt.-%~~.

14. (currently amended) Powder coating according to claim 1, ~~characterized in that it contains~~ wherein the coating additives are in an amount of 0.1 to 10 wt.-%.

15. (currently amended) Powder coating according to claim 1, ~~characterized in that it contains~~ wherein the filler is in an amount of 5 to 300 wt. %~~, preferably 10 to 200 wt. %, more preferably 10 to 100 wt. %~~, based on components (a), (b) and (c).

16. (currently amended) Powder coating according to claim 1 ~~or 15, characterized in that~~ wherein the filler is an inorganic filler.

17. (currently amended) Powder coating according to claim 16, ~~characterized in that~~ wherein the filler is fused silica or kaoline.

18. (currently amended) Powder coating according to claim 1 ~~16 or 17, characterized in that~~ wherein the filler has an average particle size of less than 30 µm~~, preferably less than 20 µm and more preferably less than 10 µm~~.

19. (currently amended) Powder coating according to claim 1 ~~or 15, characterized in that~~ wherein the filler is an organic filler which does not melt upon processing of the powder coating.

20. (currently amended) Powder coating according to claim 1 ~~or 15, characterized in that~~ wherein the filler is an organic filler which melts upon processing of the powder coating and shows phase separation upon cooling.

21. (currently amended) Powder coating according to claim 1 ~~or 15, characterized in that~~ wherein the filler is polyphenyl ether or a fluorinated thermoplastic~~, in particular, poly(tetrafluoroethylene) (PTFE), ethylene/tetrafluoroethylene copolymer (ETFE) or tetrafluoroethylene/hexafluoropropylene copolymer~~.

22. (currently amended) Powder coating according to claim 1, ~~characterized in that it~~ wherein the powder coating's coefficient of thermal expansion in the hardened state is < 70 ppm/°C, ~~preferably < 60 ppm/°C~~ in the x-, y- and z-direction.

23. (currently amended) Powder coating according to claim 1, ~~characterized in that it~~ wherein the powder coating's dielectric constant in the hardened state is < 3.8~~, preferably < 3.6~~.

24. (currently amended) Powder coating according to claim 1, ~~characterized in that it~~ wherein the powder coating is stable in storage, and wherein its exotherm does not decrease by more than 10% upon storage for three months at 25°C.

25. (currently amended) Powder coating according to claim 1, ~~characterized in that it comprises~~ comprising as component (a) about 50-90 wt.-% of epoxide and about 5-20 wt.-% of cyanate ester, as component (b) about 0.5-5 wt.% dicyandiamide and about 0.1-2 wt.-% of 2-phenylimidazole.

26. (currently amended) Process for the preparation of the curable powder coating according to claim 1, ~~characterized by~~ comprising the following steps:

(i) mixing of components (a), (b), (c) and optionally (d) and (e),

(ii) melt extrusion of the mixture obtained in step (i) and

(iii) milling and sieving of the extruded mixture.

27. (currently amended) Process according to claim 26, ~~characterized in that~~ wherein two or more of the components (a), (b), (c), (d) and (e) are used as a master batch in step (i).

28. (currently amended) Process according to claim 26 ~~or 27, characterized in that~~ wherein step (ii) is carried out such that the conversion of the reactive component is less than 20%~~, preferably less than 10%~~.

29. (currently amended) Process for the preparation of coating layers on substrates comprising the following steps:

(i) wet milling of the powder coating according to ~~one of claims~~ claim 1 ~~to 25~~, optionally with further additives to prepare a dispersion,

(ii) applying the dispersion to the substrate and

(iii) heat treating the coated substrate.

30. (currently amended) Process according to claim 29, ~~characterized in that~~ wherein the heat treatment in step (iii) is carried out such that, after applying the dispersion to the substrate, the film is first dried and melted and subsequently cured.

31. (currently amended) Process according to claim 29, ~~characterized in that~~ wherein the heat treatment of the coated substrate in step (iii) is carried out such that, after applying the dispersion to the substrate, a single step of drying, melting and curing the powder coating is carried out.

32. (currently amended) Process for preparing a multilayer structure comprising the following steps:

(i) wet milling of the powder coating according to ~~one of claims~~ claim 1 ~~to 25~~, optionally with further additives to prepare a dispersion,

(ii) applying the dispersion to a structured substrate,

(iii) heat treating the coated substrate,

(iv) drilling and metallizing,

(v) optionally repeating steps (ii) and (iv).

33. (currently amended) Process according to ~~one of claims~~ claim 29 ~~to 32, characterized in that~~ wherein the substrate is a copper sheet, a polymeric support sheet, a structured printed circuit board or a core layer thereof.

34. (currently amended) Process according to claim 33, ~~characterized in that~~ wherein the support sheet is combined with woven or non-woven fabric of glass fibre or aramide fibre.

35. (currently amended) Process according to claim 29 ~~or 32, characterized in that~~ wherein antifoaming agents, wetting agents, biocides, rheologic additives or flow-control agents are used as additives.

36. (currently amended) Process according to claim 29 ~~or 32, characterized in that~~ wherein the heat treatment or the curing is effected by

(a) melting in an oven with or without convection,

(b) infrared radiation,

(c) near infrared radiation (NIR),

(d) induction or

(e) excitation by microwaves.

37. (currently amended) Process for preparing coating layers on substrates comprising the following steps:

(i) applying the powder coating according to ~~one of claims~~ claim 1 ~~to 25~~ to a substrate,

(ii) melting the powder coating and

(iii) curing the powder coating.

38. (currently amended) Process for preparing a multilayer structure comprising the following steps:

(i) applying the powder coating according to ~~one of claims~~ claim 1 ~~to 25~~ to the substrate,

(ii) melting the powder coating followed by cooling,

(iii) laminating the coated substrate to a printed circuit board which may already comprise more than one layer,

(iv) curing,

(v) drilling and through-connecting the individual layers and substrates to prepare a multilayer structure,

(vi) optionally repeating steps (i) to (v).

39. (currently amended) Process according to claim 37 ~~or 38, characterized in that~~ wherein the substrate is a copper sheet or a polymeric support sheet.

40. (currently amended) Process according to claim 39, ~~characterized in that~~ wherein the support sheets are combined with woven or non-woven fabric of glass fibre or aramide fibre.

41. (currently amended) Process for the preparation of a multilayer structure comprising the following steps:

(i) applying the powder coating according to ~~one of claims~~ claim 1 ~~to 25~~ to a structured substrate,

(ii) melting and curing the powder coating layer followed by cooling,

(iii) drilling,

(iv) metallizing,

(v) optionally repeating steps (i) to (iv).

42. (currently amended) Process according to ~~one of claims~~ claim 37 ~~to 41,~~ ~~characterized in that~~ wherein the application of the powder coating is effected by spraying, electromagnetic brush coating, powder cloud coating or roller coating.

43. (currently amended) Process according to claim 42, ~~characterized in that~~ wherein the spraying is effected by coronar charging or triboelectric charging.

44. (currently amended) Process according to ~~one of claims~~ claim 37 ~~to 41,~~ ~~characterized in that~~ wherein the melting is effected by

(a) melting in an oven with or without convection,

(b) infrared radiation,

(c) near infrared radiation (NIR),

(d) induction or

(e) excitation by microwaves.

45. (new) Process according to claim 32, wherein the substrate is a copper sheet, a polymeric support sheet, a structured printed circuit board or a core layer thereof.

46. (new) Process according to claim 45, wherein the support sheet is combined with woven or non-woven fabric of glass fibre or aramide fibre.

47. (new) Process according to claim 32, wherein antifoaming agents, wetting agents, biocides, rheologic additives or flow-control agents are used as additives.

48. (new) Process according to claim 32, wherein the heat treatment or the curing is effected by

(a) melting in an oven with or without convection,

(b) infrared radiation,

(c) near infrared radiation (NIR),

(d) induction or

(e) excitation by microwaves.

49. (new) Process according to claim 38, wherein the substrate is a copper sheet or a polymeric support sheet.

50. (new) Process according to claim 49, wherein the support sheets are combined with woven or non-woven fabric of glass fibre or aramide fibre.

51. (new) Process according to claim 41, wherein the application of the powder coating is effected by spraying, electromagnetic brush coating, powder cloud coating or roller coating.

52. (new) Process according to claim 51, wherein the spraying is effected by coronar charging or triboelectric charging.

53. (new) Process according to claim 41, wherein the melting is effected by

(a) melting in an oven with or without convection,

(b) infrared radiation,

(c) near infrared radiation (NIR),

(d) induction or

(e) excitation by microwaves.